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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/624,397	07/22/2003	Igor C. Ivanov	5866-00400	6816

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EXAMINER	
KOCH, GEORGE R	

ART UNIT	PAPER NUMBER
1734	

DATE MAILED: 10/19/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/624,397	IVANOV ET AL.	
	Examiner	Art Unit	
	George R. Koch III	1734	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *04 August 2006*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-4,8-10,12-20 and 25-32* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-4,8-10,12-20 and 25-32* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

2. Claims 1-4, 8-10 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Li (US 2003/0235983) and Kobayashi (US 5,741,362)

Li discloses a system, comprising: a chamber (plating chamber 120) configured to process one or more wafers for the fabrication of microelectronic devices; a plurality of reservoirs (chambers 110 and 100 - see paragraph 0042) serially coupled to the chamber via a plurality of intervening pipes (fluid lines 102 and 105), wherein the system is adapted to transport a fluid used to process the wafers from the plurality of reservoirs to the chamber; one or more devices adapted to maintain the fluid supplied to the chamber within a first temperature range (heating plates, etc - see paragraphs 0040-0043); and one or more additional devices adapted to maintain the fluid residing in the various of the plurality of reservoirs within a second temperature range distinct from the first temperature range, wherein a second set of the plurality of reservoirs are used to maintain the fluid residing therein within a third temperature range distinct from the first and second temperature ranges. The apparatus of Li is considered capable of maintaining the various claimed temperatures (and see claims 3-8, and paragraphs 0061-0062).

Li discloses that a device used to maintain fluid temperatures, and passive structures for maintaining temperature differentials, but does not disclose the use of multiple devices for controlling the temperature.

However, Kobayashi (US 5,741,362) discloses using there temperature adjusters at various locations of a supply chain for a electroless plating bath system (see column 1, lines 5-10). Kobayashi uses different temperature ranges in order to ensure that no deposition is produced in the supply chain (see column 2, lines 43-45). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to have utilized the temperature adjusters of Kobayashi in order to ensure that deposition only takes place in the chamber.

As to claim 2, Li has the chamber is configured to conduct an electroless deposition process (see abstract, which refers to "electroless plating", as well as the specification in general).

As to claim 3, Li discloses transporting the fluid from the chamber to one or more of the plurality of reservoirs (see paragraphs 0040-0043), and further, as to claim 4, the apparatus is further adapted to circulate the fluid between at least two of the plurality of reservoirs.

As to claims 8-10, the apparatus of Li is capable of being used with any of the claimed temperature ranges or relationships. Li specifically discloses that the temperature of the fluid in the plating chamber 120 can be higher than that of the fluid in pre-heat chamber 110, which can be higher than that of the fluid in holding tank 100

(see paragraphs 0037-0039). In any event, Li is certainly capable of being used as claimed.

As to claim 12, Li discloses only one process chamber, and does not discloses one or more additional process chambers coupled to at least one of the plurality of reservoirs. However, the use of multiple process chambers is obvious for two separate rationales. First, official notice is taken that the use of multiple chambers is considered well known and conventional. Secondly, duplication of parts is obvious (MPEP 2144.04 VI. B.)[1] One would clearly expect that result of the duplication of the process chambers would be a result in a capability for increased substrate processing. This result is not unexpected. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to have used multiple process chambers in order to increase substrate processing capabilities. Shifting the location of the temperature controllers would not materially affect the end result, so long as proper temperature compensations were made (i.e., if heating the fluid, one has to compensate for the fact that the further away the temperature source is from the process chamber, the more of a temperature drop would occur, and a higher starting temperature). Furthermore, by moving the temperature controller into the pipe, one would reduce the chance of extreme localized temperature gradients in the process chamber in the vicinity of the heating element.

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[1] MPEP 2144.04 VI. B. Duplication of Parts
In re Harza, 274 F.2d 669, 124 USPQ 378 (CCPA 1960) (Claims at issue were directed to a water-tight masonry structure wherein a water seal of flexible material fills the joints which form between adjacent pours of concrete. The claimed water seal has a "web" which lies ** in the joint, and a plurality of "ribs" ** >projecting outwardly from each side of the web into one of the adjacent concrete slabs. <The prior art disclosed a flexible water stop for preventing passage of water between masses of concrete in the shape of a plus sign (+). Although the reference did not disclose a plurality of ribs, the court held that mere duplication of parts has no patentable significance unless a new and unexpected result is produced.).

One would select the location of heating element based on various factors, such as economics, power source capabilities, safety requirements, and any other reasonable factor. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to have placed the heating element in, or coupled to, the pipes in order to meet the requirements such as economics, power source capabilities, safety requirements, and any other reasonable factor.

3. Claims 13-20, 25, and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Li (US 2003/0235983), Kobayashi (US 5,741,362) and Juhola (5,636,762)

As to claim 13, Li discloses a system, comprising: a chamber (plating chamber 120) configured to process one or more wafers for the fabrication of microelectronic devices; a plurality of tanks (tanks 110, 100) serially coupled to the chamber and adapted to store a fluid used to process the wafers; and a plurality of temperature controllers (heating plates 208, control processes, etc, see paragraph 0054-57)positioned within the system such that the chamber and the plurality of tanks are characterized into at least three different zones based upon adaptations of the temperature controllers to maintain the fluid within distinct temperature ranges in the respective zones while processing the wafers. Li specifically discloses that the temperature of the fluid in the plating chamber 120 can be higher than that of the fluid in pre-heat chamber 110, which can be higher than that of the fluid in holding tank 100

(see paragraphs 0037-0039). In any event, Li is certainly capable of being used as claimed.

Li can be interpreted as discloseingthat a device used to maintain fluid temperatures, and passive structures for maintaining temperature differentials, but not disclosing the use of multiple devices for controlling the temperature.

Optionally, depending on the interpretation selected for a plurality of temperature controllers, Kobayashi (US 5,741,362) discloses using there temperature adjusters at various locations of a supply chain for a electroless plating bath system (see column 1, lines 5-10). Kobayashi uses different temperature ranges in order to ensure that no deposition is produced in the supply chain (see column 2, lines 43-45). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to have utilized the temperature adjusters of Kobayashi in order to ensure that deposition only takes place in the chamber.

Li clearly does not disclose a plurality of volume sensors.

Juhola discloses that it is known to use volume (or level) sensor in the tanks (items 98-101) in order to maintain proper volumes of the process fluid. Juhola discloses that these sensor allow for refilling of the intermediate tank. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to have utilized the volume level sensors as disclosed in Juhola in order to allow for appropriate volumes in the tanks.

As to claim 14, Li discloses that the plurality of temperature controllers are positioned such that the at least three different zones are arranged in ascending order

based upon their respective temperature ranges, and wherein the zone comprising the chamber has the highest temperature range. Li specifically discloses that the temperature of the fluid in the plating chamber 120 can be higher than that of the fluid in pre-heat chamber 110, which can be higher than that of the fluid in holding tank 100 (see paragraphs 0037-0039). In any event, Li is certainly capable of being used as claimed.

As to claim 15, while Li discloses the alternative arrangement (process chamber is higher, bath chamber is lower), the applicant is claiming an apparatus, the intended use does not modify the structure of this apparatus, and Li is capable of being used as claimed.

As to claim 16, Li discloses that one of the plurality of temperature controllers (such as heating plate 208) is arranged within the chamber (the process chamber 120).

As to claim 17, Li discloses that one of the plurality of temperature controllers is coupled to a fluid inlet of the chamber (and see Figure 2a, which shows that the heating element 208 is coupled near to a fluid inlet of the chamber). The proximity of the temperature controller to the fluid inlet in Li would read upon the language "coupled".

As to claim 18, Li does not disclose that one of the plurality of temperature controllers is coupled to one of a plurality of pipes configured to transport the fluid from the plurality of tanks to the chamber. However, the placement of the temperature controllers such that they are coupled to the pipes is obvious due to two separate rationales. First, official notice is taken that the claimed placement of the temperature

controllers coupled to the pipes is considered well known and conventional. Secondly, rearrangement of parts is obvious (MPEP 2144.04 VI. C.)[2]

As to claim 19, Li discloses that one of the plurality of temperature controllers is arranged within one of the plurality of tanks (see Figure 2a, item 208).

As to claim 20, Li does not disclose that the at least one of the plurality of temperature controllers comprises an infrared heater. However, official notice is taken that infrared heaters are well known and conventional. The prior art discloses that any generic heating could be used (Li, paragraph 0042, "...can be pre-heated...by any suitable method"). One in the art would recognize that infrared heaters are such a suitable method (as well as electric plate heating, resistance heating, etc). One would select the heating element based on various factors, such as economics, power source capabilities, safety requirements, and any other reasonable factor. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to have used infrared heating in order to meet the requirements such as economics, power source capabilities, safety requirements, and any other reasonable factor.

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[2] MPEP 2144.04 VI. C. Rearrangement of Parts
In re Japikse, 181 F.2d 1019, 86 USPQ 70 (CCPA 1950) (Claims to a hydraulic power press which read on the prior art except with regard to the position of the starting switch were held unpatentable because shifting the position of the starting switch would not have modified the operation of the device.); In re Kuhle, 526 F.2d 553, 188 USPQ 7 (CCPA 1975) (the particular placement of a contact in a conductivity measuring device was held to be an obvious matter of design choice). However, "The mere fact that a worker in the art could rearrange the parts of the reference device to meet the terms of the claims on appeal is not by itself sufficient to support a finding of obviousness. The prior art must provide a motivation or reason for the worker in the art, without the benefit of appellant's specification, to make the necessary changes in the reference device." Ex parte Chicago Rawhide Mfg. Co., 223 USPQ 351, 353 (Bd. Pat. App. & Inter. 1984).

As to claim 25, Li discloses that the tanks have different volume capacities (see paragraphs 0039, 0040, 0041 and 0042, which disclose a large volume for the holding tank, and keeping 10% of the bath in the "smaller" intermediate tank).

As to claim 26, Li discloses a plurality of pipes (see figure 1) transporting fluid as claimed, and the disposition of the tanks such that one tank is closer to the chamber (see Figure 1). Also, Li discloses the relative volume capacities, such that one tank comprises a larger volume capacity, and the intermediate tank and plating chamber having the same capacity (see paragraph 0046).

4. Claims 27-31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Li (US 2003/0235983), Kobayashi (US 5,741,362) (as applied to claim 1 above) and further in view of Shacham-Diamond (US 5,830,805).

Li as discussed above discloses a first chamber as claimed, a first temperature controller, a storage tank, an intermediate tank, a first set of pipes transporting process fluid from the storage tank to the intermediate tank and a second set of pipes transporting the process fluid from the intermediate tank to the chamber.

Li can be interpreted as discloseingthat a device used to maintain fluid temperatures, and passive structures for maintaining temperature differentials, but not disclosing the use of multiple devices for controlling the temperature.

Optionally, depending on the interpretation selected for a plurality of temperature controllers, Kobayashi (US 5,741,362) discloses using there temperature adjusters at various locations of a supply chain for a electroless plating bath system (see column 1,

lines 5-10). Kobayashi uses different temperature ranges in order to ensure that no deposition is produced in the supply chain (see column 2, lines 43-45). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to have utilized the temperature adjusters of Kobayashi in order to ensure that deposition only takes place in the chamber.

Li does not disclose pipes configured to transport the process fluid from the chamber directly to the intermediate tank.

However, Shacham-Diamond discloses a pipe (pipe 124) equivalent to the third pipe, which configured to transport process fluid directly from the process chamber to the intermediate or holding chamber (item 148). In addition, Shacham-Diamond discloses a pipe equivalent to the second pipe (and equivalent to the pipe in Li) that transports fluid from the intermediate holding tank to the chamber (the circuit of pipes 158, 164, and 125), as well as a pipe equivalent to the first set of pipes (and equivalent to the pipe in Li, pipe 130, which supplies the holding tank from the supply system, which is not shown). Thus, Shacham-Diamond discloses the basic pipe supply system in Figure 3. Shacham-Diamond discloses that pipe 124 and valve 127 permit recirculation of the process fluid (see colum 6, which discloses the recirculation system). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to have utilized the pipe system of Shacham-Diamon in order to permit recirculation of the processing fluid.

As to claims 28-31, the apparatus of Li is capable of being used with any of the claimed temperature ranges or relationships. Li specifically discloses that the

temperature of the fluid in the plating chamber 120 can be higher than that of the fluid in pre-heat chamber 110, which can be higher than that of the fluid in holding tank 100 (see paragraphs 0037-0039). In any event, Li is certainly capable of being used as claimed.

5. Claim 32 is rejected under 35 U.S.C. 103(a) as being unpatentable over Li (US 2003/0235983), Kobayashi (US 5,741,362) and Shacham-Diamond (US 5,830,805) as applied above, and further in view of Juhola (5,636,762)

As to claim 32, Li clearly does not disclose a plurality of volume sensors.

Juhola discloses that it is known to use volume (or level) sensor in the tanks (items 98-101) in order to maintain proper volumes of the process fluid. Juhola discloses that these sensor allow for refilling of the intermediate tank. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to have utilized the volume level sensors as disclosed in Juhola in order to allow for appropriate volumes in the tanks.

Response to Arguments

6. Applicant's arguments (based on the amendments) with respect to claims 1-4, 8-20, 25-32 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

7. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to George R. Koch III whose telephone number is (571) 272-1230 (TDD only). If the applicant cannot make a direct TDD-to-TDD call, the applicant can communicate by calling the Federal Relay Service at 1-866-377-8642 and giving the operator the above TDD number. The examiner can also be reached by E-mail at george.koch@uspto.gov <mailto:george.koch@uspto.gov> in accordance with MPEP 502.03. The examiner can normally be reached on M-F 9-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Christopher Fiorilla can be reached on (571) 272-1187. The fax phone

number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

George R. Koch III
Primary Examiner
Art Unit 1734

GRK
10/15/2006